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Complete set of claims

1(previously amended). A positive bottom photoimageable antireflective coating composition which is capable of being developed in an aqueous alkaline developer, wherein the antireflective coating composition comprises a water insoluble polymer comprising at least one recurring unit with a chromophore group and one recurring unit with a hydroxyl and/or a carboxyl group, a vinyl ether terminated crosslinking agent, and optionally, a photoacid generator.

2(original). The composition according to claim 1, wherein the chromophore group is chemically bonded to the polymer and is selected from a compound containing aromatic hydrocarbon rings, a substituted or unsubstituted phenyl group, a substituted or unsubstituted anthracyl group, a substituted or unsubstituted phenanthryl group, a substituted or unsubstituted naphthyl group, a substituted or an unsubstituted heterocyclic aromatic rings containing heteroatoms selected from oxygen, nitrogen, sulfur, and a mixture thereof.

3(original). The composition according to claim 1, wherein the recurring unit containing a hydroxyl and/or a carboxyl group is derived from a monomer selected from acrylic acid, methacrylic acid, vinyl alcohol, hydroxystyrenes, copolymers of hydroxystyrene and vinyl monomers containing 1,1,1,3,3,3-hexafluoro-2-propanol.

4(currently amended). ~~The composition according to claim 1, wherein the~~ A positive bottom photoimageable antireflective coating composition which is capable of being developed in an aqueous alkaline developer, wherein the antireflective coating composition comprises a water insoluble polymer comprising at least one recurring unit with a chromophore group and a hydroxyl and/or a carboxyl group ~~are present in the same recurring unit.~~, a vinyl ether terminated crosslinking agent, and optionally, a photoacid generator.

5(original). The composition according to claim 1 comprising a vinyl ether terminated crosslinking agent represented by the general structure below;

$$R\text{—}\left(OCH{=}CH_2\right)_n$$

wherein, R is selected from a (C_1-C_{30}) linear, branched or cyclic alkyl, substituted or unsubstituted (C_6-C_{40}) aryl, and substituted or unsubstituted (C_7-C_{40}) alicyclic hydrocarbon; and $n \geq 2$.

6(previously amended). The composition of claim 1, further comprising a thermal acid generator.

7(previously amended). The composition of claim 6, where the acid derived from the thermal acid generator has a pKa greater than 1.0.

8(previously amended). The composition of claim 6, where previously the acid derived from the thermal acid generator is removed from the antireflective coating at temperatures below 220°C.

9(original). The composition according to claim 1 further comprising a dye.

10(original). The composition according to claim 9, wherein the dye is selected from the group consisting of a monomeric dye, a polymeric dye and a mixture of a monomeric and a polymeric dye.

11(previously amended). The composition according to claim 1, wherein the antireflective composition has a k value in the range of 0.1 to 1.0.

12(cancel).

13(original). The composition according to claim 1, wherein the photoacid generator is sensitive to actinic radiation in the range of 50 nm to 450 nm.

14(withdrawn-previously amended). A process for forming a positive image comprising:

a) forming a coating of the bottom photoimageable antireflective coating composition of claim 1 on a substrate;

b) baking the antireflective coating,

c) providing a coating of a top photoresist layer over the bottom coating;

d) imagewise exposing the photoresist and bottom coating layers to actinic radiation of same wavelength;

e) post-exposure baking the photoresist and bottom coating layers on the substrate; and,

f) developing the photoresist and bottom coating layers in the same step with an aqueous alkaline solution.

15(withdrawn). The process according to claim 14, further comprising the step of removal of an edgebead after the coating and prior to the baking of the antireflective coating composition.

16(withdrawn). The process according to claim 14, wherein the antireflective coating becomes insoluble in organic solvents and aqueous alkaline solution after the baking step prior to coating the photoresist layer and becomes soluble in aqueous alkaline solution after exposure to actinic radiation prior to developing the photoresist and bottom antireflective coating layer.

17(previously presented). The composition according to claim 1, where the composition further comprises an acid.

18(previously presented). The composition of claim 17, where the acid has a pKa greater than 1.0.

19(previously presented). The composition of claim 17, where the acid is removed from the antireflective coating at temperatures below 220°C.

20(new). The composition according to claim 4, wherein the chromophore group is chemically bonded to the polymer and is selected from a compound containing aromatic hydrocarbon rings, a substituted or unsubstituted phenyl group, a substituted or unsubstituted anthracyl group, a substituted or unsubstituted phenanthryl group, a substituted or unsubstituted naphthyl group, a substituted or an unsubstituted heterocyclic aromatic rings containing heteroatoms selected from oxygen, nitrogen, sulfur, and a mixture thereof.

21(new). The composition of claim 4, where the chromophore group has a pendant hydroxyl and/or a carboxyl group and/or the hydroxyl and/or a carboxyl group are attached to the same group.